## Space Weather Forecast

Issued on Monday, 10 June 2024 at 00:19 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Risk of Minor/Moderate geomagnetic storm day 1 (10 June). Chance of Minor/Moderate radio blackouts throughout.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Activity is Moderate with a couple of weak Moderate-class flares. No new CMEs were noted in the period.

There are currently ten sunspot regions on the Earth-facing side of the Sun. The most active region on the disc remains a large and complex group on the southwest limb, with this group showing signs of decline. Other regions are smaller, magnetically simpler and either showing slight decay or little change in development.

**Solar Wind / Geomagnetic Activity:** Solar winds showed coronal hole fast wind influence being at elevated levels at first then easing towards Slow levels. The magnetic field trace was weak as was the north-south component. The net result of the above solar wind measures was for Quiet geomagnetic levels with one Unsettled interval early in the period.

**Energetic Particles / Solar Radiation:** Solar radiation levels have eased back to just below Minor solar radiation levels. 100MeV protons also showed a slow downward trend.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** There is a Chance of further isolated Moderate-class flares, most probably from the sunspot regions in the far southeast and far southwest.

**Solar Wind / Geomagnetic Activity:** The CME associated with the 08/0149UTC Moderate-class flare shows an 'asymmetric halo' in its shock, and there is considered a risk of G2 moderate geomagnetic storm conditions on Monday 10 June. This is the only CME currently in the forecast.

Background to Slightly elevated solar winds are expected on day 1 (09 June). On day 2 (10 June) solar winds are likely to become elevated, perhaps strong, with the anticipated 08 June CME arrival. Winds will then gradually subside through days 3 and 4 (11 and 12 June).

Geomagnetic activity is expected to be Quiet to Unsettled on day 1 (09 June). The arrival of 08 June CME is expected during the UTC morning of day 2 (10 June), with G2/Moderate geomagnetic storm conditions likely to develop for a time. Elevated geomagnetic activity may linger into the start of day 3 (11 June), before gradually waning to mainly Quiet by the end of the four-day period.

**Energetic Particles / Solar Radiation:** High energy proton flux will continue to show a very gradual waning tendency following its S3 Strong solar radiation storm peak, although proximity

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to this level means that any further suitable events from the western sunspot group may see levels rise once again. Minor solar radiation S1 is therefore expected at first, with a slight chance of S2, falling to an expected background levels into day 2 (10 June).

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 50 | 20 | 1 | 1 |
| Strong | G3 | No | 5 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | Yes | 50 | 40 | 20 | 30 |
| Very Active | R3 to R5 X | No | 10 | 5 | 1 | 1 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | Yes | 50 | 20 | 10 | 5 |
| Very Active | ≥ S3 * | No | 5 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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